



Fishing for Solutions in a Changing Ocean

Summary of a COMPASS Science and Decision Roundtable

Changes in the ocean, such as increasing temperatures and acidification, are affecting fishing practices and communities, the distribution and abundance of fish stocks, and the solutions for effective fisheries management.¹

Fisheries managers recognize that dealing with the impacts of ocean change is important and increasingly urgent, but their ability to focus on near- and long-term solutions to emergent issues is often constrained by the urgency of their current day-to-day workloads and existing management implementation timelines.

In many cases, mechanisms already exist that can help fisheries managers effectively manage the impacts of ocean change on short and long time scales. Meaningful collaboration and communication between managers, scientists, and policy staff is necessary to resolve conflicts, increase understanding of the likely impacts of ocean change on marine species and fisheries management, identify effective solutions, and encourage adaptive decision-making.

COMPASS, with support and thought leadership from the David and Lucile Packard Foundation and the Lenfest Ocean Program, convened experts from the fisheries, marine ecology, social science, policy, law, and management fields for a roundtable in May 2018 to explore decision-relevant questions related to changing ocean ecosystems. A major goal of this roundtable was to encourage policymakers, managers, and scientists to share experiences, exchange ideas, and identify innovative solutions.

This roundtable was strategically designed to build upon previous work by the Mid-Atlantic Fishery Management Council,² Fisheries and Leadership Sustainability Forum,³ California Ocean Science Trust,⁴ and Atlantic States Marine Fisheries Commission.⁵ In preparation, COMPASS assessed the landscape through over 75 conversations with scientists, managers, and policy experts. This summary presents challenges and opportunities identified through these conversations and the roundtable. A list of roundtable participants is also included.



Challenges and Constraints

Participants identified several challenges and constraints that could hinder the adaptation of near- and long-term solutions to ocean change, two of which are described here. **Fisheries management systems have different levels of preparedness across regions**, for reasons including different severity of impacts from ocean change, different historical contexts, and unique regional cultures. This regional variation means there is no “one size fits all” solution. Also, fisheries managers increasingly face **a need to plan ahead for long-term changes that are underway** and move beyond reactive, short-term management, while continuing to fulfill current Magnuson-Stevens Fishery Conservation and Management Act (MSA) requirements.

Key Opportunities

Integrating scientific insights into management and policy can clarify options for preparedness and response. Opportunities for more adaptive and collaborative ocean management include:

1. Matching data and science to the scale of decisions can result in research that is more relevant for fisheries managers. Scientists and managers can consider both temporal scales (i.e. near-, medium-, long-term) and spatial scales (i.e. local, state, federal geographies).
2. Managers can also more effectively respond to ocean change with more data on economic and cultural impacts of ocean change to fishermen and communities. More accessible, near-term forecasts of species shifts and community impacts (e.g. on a three- to five-year timescale) could help managers inform future planning.⁶

3. Ecosystem-level approaches (e.g. ecosystem-based management, ecosystem assessments, and fishery ecosystem plans) are continually being developed and integrated into fisheries management and will be useful in managing the impacts of ocean change on particular stocks.
4. Stock assessments have limitations and uncertainties, but managers trust them as a basis for management decisions. Other newer types of scientific knowledge, such as ecosystem assessments or integrated information about the effects of climate change on the ocean and on communities, would benefit from strategic framing and a process to help establish trust, legitimacy, and credibility among managers.
5. States and Fishery Management Councils (FMCs) can develop management that is regionally relevant and could explore different management options by comparing what strategies work in various locations.
6. At the federal level, Congress could play a role by helping to facilitate stronger relationships between managers, stakeholders, policymakers, and others. Stronger collaboration across agencies (e.g. between NOAA and the Bureau of Ocean Energy Management) and across regional management boundaries would also help enhance management decisions.
7. Dynamic Ocean Management is an approach that provides options for rapidly responding to changing conditions.⁷ Pilot studies have shown that this approach can create a win-win situation of increasing sustainability and economic gains. As this approach further develops, it could play an important role in managing fisheries in a changing climate.
8. A key avenue for collaboration could be to incorporate information about the effects of climate into management planning processes well in advance of a manager needing to make a specific decision. This could include projections of future habitats and fish stocks, analyses of the vulnerability of certain species, or ecosystem indicators linked to changes in fish abundance or distributions. Effectively integrating such information could require coordination across FMCs.



Next Steps

Roundtable participants identified the following areas of near- to medium-term work that could advance research and inform management processes:

- **Develop Northeast (New England and Mid-Atlantic) regional scenarios of impacts from shifting fish distributions on people and economies.** Collaborative scenario development could provide decision makers with critical information, enabling managers to better predict and respond to changes in fish distributions. Scenario development could foster collaboration across political boundaries or management organizations.⁸
- **Use legal analysis to describe available tools and opportunities** for responding to ocean change under current legislation.
- **Evaluate the suite of options available for fisheries management responses to shifting fish distributions.** Specific strategies to consider include Dynamic Ocean Management, thresholds for management responses, property-rights based approaches, and how management could respond to individual actions such as planned exit of fishery (e.g. sale of quota or vessel) or emerging fisheries.
- **Conduct and communicate research about the economic/socio-cultural dimensions of ocean change.** Social science research on topics ranging from fleet dynamics to community adaptation could provide a richer understanding of the implications and impacts of proposed changes in policy and management.
- **Study how fish species move into new regions.** Understanding dynamic fish populations could help managers anticipate potential surprises; process-based distribution models that incorporate dispersal, growth, and mortality would be similar to stock assessments and could be more trusted than existing habitat-based models.
- **Identify and publicize near-term opportunities for scientists to contribute to management decisions within each region.** For example, delivering more accurate information on decision-relevant timescales would enable fisheries managers to better plan for and respond to changing ocean conditions.
- **Communicate strategically to raise awareness of issues and solutions.** Carefully developed messaging can make stakeholders—including policy staff and fisheries managers—aware of emerging issues and relevant research. Clear and open communication is a critical element of successfully managing for the impacts of ocean change.



Tim Carruthers

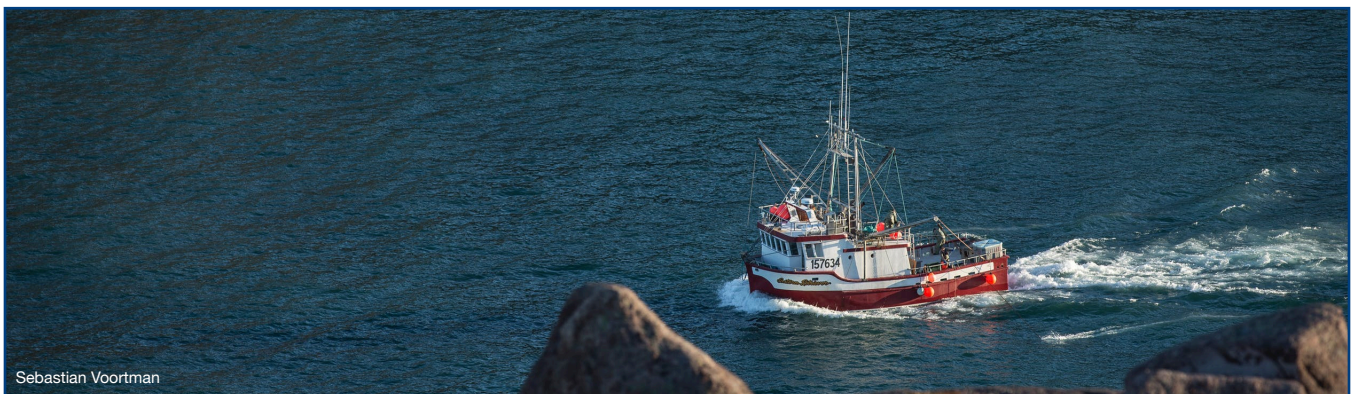
Participants

Participants represented an array of perspectives based on scientific disciplines (e.g. marine ecology, theoretical biology, conservation social science, economics, anthropology), affiliations, and expertise in policy, law, and resource management. In addition to those listed below, COMPASS invited several current and former White House staff members to share their insights, as well as Capitol Hill staff members.

Ana Spalding	Oregon State University; Smithsonian Tropical Research Institute
Bill Tweit	Washington Department of Fish and Wildlife; North Pacific FMC
Doug Lipton	NOAA Fisheries
Emily Knight	The Pew Charitable Trusts, Lenfest Ocean Program
Jay Odell	The Nature Conservancy
Joshua Abbott	Arizona State University
Kristin Kleisner	Environmental Defense Fund
Leila Sievanen	Ocean Science Trust
Lisa Suatoni	Natural Resources Defense Council
Malin Pinsky	Rutgers University
Marissa Baskett	University of California Davis
Michael Luisi	Maryland Department of Natural Resources; Mid-Atlantic FMC
Patricia Clay	NOAA Fisheries, Northeast Fisheries Science Center
Roger Griffis	NOAA Fisheries
Sara Maxwell	Old Dominion University
Sarah Close	The Pew Charitable Trusts, Lenfest Ocean Program
Susan Farady	University of New England
Toni Kerns	Atlantic States Marine Fisheries Management Commission
William Goldsmith	Knauss Marine Policy Fellow

COMPASS staff organized, designed, and facilitated the roundtable:

Erica Goldman	Director of Policy Engagement
Heather Mannix	Assistant Director of Policy Engagement
Jacob Robertson	Program Assistant
Meg Nakahara	Policy Engagement Specialist
Stephen Posner	Assistant Director of Policy Engagement



References

¹ Pinsky, M.L., Mantua, N.J. 2014. Emerging adaptation approaches for climate-ready fisheries management. *Oceanography* 27(4): 146–159.

² Mid-Atlantic Fishery Management Council. 2014. Report on east coast climate change and fisheries governance workshop. Washington, D.C.: MAFMC.

³ Latanich, K., Gordon, K., Hamer, C., eds. 2017. Managing fisheries in a changing environment: Discussions from the May 1–2, 2017 forum in Monterey, California. NI P 17-01. Durham, NC: Fisheries Leadership & Sustainability Forum, Duke University.

⁴ Chavez, F.P., Costello, C., Aseltine-Neilson, D., et al. 2017. Readying California Fisheries for Climate Change. Oakland, CA: California Ocean Science Trust.

⁵ Atlantic States Marine Fisheries Commission. 2018. Management, Policy and Science Strategies for Adapting Fisheries Management to Changes in Species Abundance and Distribution Resulting from Climate Change. Arlington, VA: ASMFC.

⁶ Morley, J.W., Selden, R.L., Latour, R.J., et al. 2018. Projecting shifts in thermal habitat for 686 species on the North American continental shelf. *PLOS ONE* 13(5): e0196127.

⁷ Maxwell, S.M., Hazen, E.L., Lewison, R.L., et al. 2015. Dynamic ocean management: Defining and conceptualizing real-time management of the ocean. *Marine Policy* 58: 42-50.

⁸ Pinsky, M.L., Reygondeau, G., Caddell, R., et al. 2018. Preparing ocean governance for species on the move. *Science* 260 (6394): 1189-1191.



For More Information

Heather Mannix

Assistant Director of Policy Engagement
heather.mannix@COMPASSscicomm.org

Stephen Posner

Assistant Director of Policy Engagement
stephen.posner@COMPASSscicomm.org

Since 1999, COMPASS has trained thousands of scientists to more effectively engage with society, and brokered hundreds of relationships for scientists with their peers, journalists, and policymakers, helping them reach places like the front page of the New York Times, the halls of Congress, and the White House. Our approach to our work has positioned us as a trusted, knowledgeable, and neutral intermediary that policymakers and journalists can turn to in order to connect to the scientists that have clear and relevant information.

Connect with COMPASS at: COMPASSscicomm.org